A STUDY TO DETERMINE THE CONSTRUCT VALIDITY OF THE GRAMMATIC CLOSURE SUBTEST AS A MEASURE OF LANGUAGE ABILITY USING SIGNAL DETECTION THEORY

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PREFACE

This study is concerned with determining the construct validity of the Grammatic Closure subtest of the Illinois Test of Psycholinguistic Abilities. Two additional versions of the subtest were constructed to enable the author to perform this task. Signal Detection Theory was employed to design one of the versions and to gain index numbers of ability and response criterion. A Restatement version is used to clarify the Signal Detection version and to give another measure of eliciting children's inflectional responses.

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sat up so many nights till I drove in from Stillwater and who has aided Jimmy and Val in keeping the home fires burning--thanks and love.

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CHAPTER I

THE RESEARCH PROBLEM

Introduction

Many preschool programs now in operation and currently being formulated are basing their formats on the idea of working with high-risk children to build their areas of ability and remediate their areas of deficit in order to prevent later school learning problems (Moore, 1971; Fygetakis and Ingram, 1973; Yonemura, 1969; Hammill and Larsen, 1974).

The importance of dealing with language behaviors in early childhood has been largely an area that has been the domain of those working in bidialectic and bilingual education. With the advent of emphasis on the learning disabled child, the links between language disorders and later reading and writing disorders began to be a matter for investigation. However, school programs have been slow to incorporate ideas gathered from such investigations.

In spite of the verbal support given to individualization of instruction, the actual programs operate on the idea that "it won't hurt them even if they don't need it." These programs may be based on one philosophy or approach such as a visual training program or a purely motoric program. These programs may employ a multi-approach which uses a little of everything such as visual training, socialization

exercises, auditory training, fine motor training, and gross motor activities. Many of these compensatory programs use the same approach with each child, not taking his specific individual propensities and needs into account. If these programs are to more nearly meet the needs of each child, then it is important that the programs of the future be knowledgeable about the needs and abilities of each child.

This paper will concern itself with children's language behavior in language assessment situations. Language assessment methods must give specific information about the child being assessed so that the language programs designed for the child will not spend valuable time concentrating on the child's visual-motor skills, when, in fact the problem may be with the child's language.

The bulk of preschool and early school language problems seems to be based in the child's use and comprehension of standard English. Apparently, inability to use the language as a speaker and to comprehend the language as a listener also impairs the child in the ability to make the transfer from spoken to printed language. There are some children who do not come to use the language adeptly and thus, this language deficit carries over into later school tasks (Gibson, 1966; Joos, 1966, Newcomer et al., 1975; Newcomer, 1975; Shuy, 1973; Moore, 1971). Few programs now in existence do specific language training for children who are in need of such training. In order for this training to be effective, it must be fitted to the child's specific language needs. Each child is at a different level with strictly unique problems and abilities. Thus, the means of determining what those needs are must be sensitive enough to give information that can guide remediation (Moore, 1971; Tyack, 1973).

Various instruments are used to assess and predict language behavior in children (McNeill, 1970; Lee, 1974; Lee and Canter, 1971). Some of these instruments tell the examiner about the child's ability to verbalize language correctly and to use it in the proper context (performance). Some tests such as the Grammatic Closure subtest of the ITPA (McCarthy and Kirk, 1968) require only a single word completion to a carefully structured sentence. This type of test is usually purported to elicit representative inflections with the examiner supplying the obligatory contexts (Brown, 1973). Tests of this type give the examiner only a very small sampling of the child's grammatical functioning. Other tests such as the Lee Developmental Sentence Analysis (Lee, 1974) require that a complete running sample of the child's conversational language be garnered and analyzed. These latter kind of tests give the examiner a very broad sample of the child's language behavior. A very few tests examine the child's ability to understand language which they hear (comprehension). Usually these tests require that the child listen to a stimulus sentence or word and respond motorically by pointing to the correct picture. These tests tend to assume that the child's motoric performance is representative of his underlying comprehension. The Carrow Test for Auditory Comprehension of Language is such a test (Carrow-Woolfolk, 1973).

The Illinois Test of Psycholinguistic Abilities (ITPA) (McCarthy and Kirk, 1968) is one instrument that has come to be widely used in the last few years for language assessment. Several of the subtests of the ITPA have been singled out as particularly useful in predicting certain school learning behaviors. One group of studies (Newcomer et al., 1975; Newcomer, 1975; Newcomer and Hammill, 1975; Hammill et al.,

1975) has specifically linked the Grammatic Closure subtest to later reading and writing behaviors. These same studies indicate that Grammatic Closure is the only subtest of the ITPA which has any predictive validity with regard to academic behaviors. If the Grammatic Closure subtest is useful as a predictive entity, it is important to know exactly what is being measured by this test in order to plan more meaningful remedial programs.

Some authors (Moore, 1971, Cazden, 1972, Cazden, 1973; Cazden, 1975; Newcomer, 1975; Shapiro, 1973) feel that many language tests are not true measures of the child's ability to comprehend and produce language because their scoring procedures do not take into account many extraneous factors. Among these are such factors as the test situation, the child-examiner relationship, reticence on the child's part, the child's health and well-being at the time of the test, and the social situation from which the child comes. Shapiro (1973) points out that the testing situation is at best still a contrived situation. Moore (1971) and Cazden (1972) both feel that children do not interact well with strangers, thus, inhibiting rapport. Newcomer (1975), in talking of the social setting from which the child comes, says race and socioeconomic level affect linguistic measures. Further, it is seen as impossible to get an accurate idea concerning a child's language behavior by the use of short-term tests because children tend to be inconsistent in their language performance (Moore, 1971; Lee, 1974). The Grammatic Closure subtest of the ITPA is a short-term test, thus, it may be more useful as a screening test to determine which children may have later language-related problems. This may be a more pragmatic application rather than its use as an instrument upon which to build a

program since research has shown that remediation based upon the auditory subtests of the ITPA has not been successful (Hammill and Larsen, 1974; Newcomer, 1975; Bannatyne, 1973).

The Grammatic Closure subtest is designed to discover the extent to which the child has developed the "ability to make use of the redundancies of oral language in acquiring automatic habits for handling syntax and grammatic inflections" (Kirk and Kirk, 1971, p. 24). The researcher is left to make the following assumption: Actual comprehension may only be inferred from the child's performance; thus, if the child performs well, then his comprehension is inferred to be adequate and if he does not perform well, then his comprehension is inferred to be inadequate. But this is not known since only performance is measured. Whether or not the child possesses the correct grammatical form in his repertoire may be an issue for remedial formulations. A child may be penalized by his lack of fluency in this situation due to reticence or a number of other factors. Or he may not be able to respond because of a comprehension problem. The Grammatic Closure subtest does not differentiate between the two abilities, performance and comprehension, in its scoring procedures. Due to its short format, it does not control such variables as reticence; thus, a remedial program may be prescribed for the child which is either redundant because the child may actually have the information, or is misdirected since it is unclear just exactly what a score on this subtest means in the way of psycholinguistic skills.

The Problem

This study is addressed to the question of the construct validity of the Grammatic Closure subtest of the ITPA as a measure of the production of language. Current research points to the importance of the ITPA in predicting later learning behaviors in reading and spelling, so the information that it actually gives is of importance to those who use the test.

The Grammatic Closure subtest relies on visual and auditory cues and the scoring is dependent upon a spoken response. Thus, several variables enter into the final results of the test. These include the previously mentioned extraneous test situation and individual variables, i.e., reticence, and the fact that the Grammatic Closure subtest is a short-term test. The lack of differentiation between performance and comprehension on the subtest influences the interpretation of the scores. Due to any of these factors, the child may fail to perform adequately. A true ability level cannot be determined unless the extraneous variables are accounted for in some manner. For example, a child may be non-fluent in the testing situation because of the presence of a strange adult. This is a difficulty in any testing situation and particularly one in which the child must make some overt response. The problem is that the Grammatic Closure subtest may not clearly demonstrate the child's true level of language functioning. It is important to determine how much of the score on the subtest is due to the child's ability to discriminate the correct language form.

The Purpose of the Study

Thus, following in this line of thought, the purpose of this study is to determine the construct validity of the Grammatic Closure subtest by determining if performance on this subtest is related more heavily to sensitivity (d') or to the child's response strategy (Lx).

This will be accomplished through an application of Signal Detection Theory to the administration and interpretation of three different forms of the Grammatic Closure subtest, each with a different set of directions.

If the Grammatic Closure subtest is a valid measure of children's language production then the d' scores should be high and should correspond significantly with the subtest raw scores.

Research Data

The goal of this study is to determine the validity of the Grammatic Closure subtest of the ITPA as a measure of language ability.

The Grammatic Closure subtest was administered to all subjects. Two more versions were administered during the same session to all subjects. Each version used different directions. Of the latter two, one was a modification of the subtest according to Signal Detection Theory. The final version was simply a restatement version of the original. Thus, three sets of raw scores were obtained for each child as well as two index numbers, d' and Lx derived from the version of the subtest modified by Signal Detection (Jones, 1975). Applying Signal Detection Theory to psychometrics involves redesigning the test to yield yes or no answers. Actually it is considered to be the same test with

different directions. The two index numbers yielded by SDT methods, d' and Lx are methods for partialling out the sensitivity of the test taker from the strategy or response criteria of the test taker. The various scores were compared using Pearson's Product-Moment Coefficient. A confidence level of .05 was chosen as the level at which the coefficient would be significantly different from zero.

The comparison of the Grammatic Closure subtest with the Signal Detection modified version of the subtest provided a comparison of comprehension with performance of language. In the standard administration the child was expected to perform by providing the correct answer orally, while in the modified Grammatic Closure subtest the child was given a correct or incorrect answer and was expected to indicate comprehension through a yes or no answer. This was double-checked in the Restatement administration by asking the child to repeat the stimulus provided by the examiner. For example, in the modified version the examiner might say, "Here is a foot; Here are two foots. Are these foots?" The child could then answer "yes," "no" or "I don't know." Immediately following each item of that sort the examiner asked the Restatement version which, in this example, was "What are they?" And the child had the option at that point of concurring with the examiner and saying "foots" or restating it in correct terms. The theory behind this, according to Gleason (1967) is that the child will tend to repeat a grammatical form at the level of language in which he is currently functioning. Comparison of the Standard version with the Restatement could also be said to be a test-retest with interference intervening.

Research Questions

This study was designed to answer the following questions:

1. Does the child's score on the Grammatic Closure subtest represent his true sensitivity to the task of discriminating the correct grammatical form or is it heavily influenced by "other" factors or noise?

2. Does the score on the Grammatic Closure subtest represent both comprehension and performance of language?

Operational Definitions

Syntax--That part of the grammar that consists of rules for combining words into sentences (Cazden, 1972).

Grammar--Description of a language written by linguists (Cazden, 1972).

"Other" factors--Any variable which has a significant effect on a person's test behavior. This may include such factors as reticence, race, room noises, rapport or lack of it, compliance, etc.

Closure--It is a process of matching incomplete perceptions against long-term, previously learned, integrated experience (Bannatyne, 1971).

Grammatic Closure--This refers to the child's ability to make use of the redundancies of oral language in acquiring habits for handling syntax and grammatic inflections (Paraskevopoulos and Kirk, 1969).

Comprehension--Knowledge of grammatical forms. It is unconscious and underlies overt behavior (Brown, 1973).

Performance--The oral production of grammatical forms.

Inflection--The addition of certain endings to the base of a word to express such meanings as number and tense.

Signal Detection Theory--Also known as Sensory Decision Theory, this is a method or statistical technique derived from psychophysiology which distinguishes between the person's sensitivity for a task and his strategy for reporting his reactions to the task. In other words, it separates the observer as a sensor from the observer as a decision maker, i.e., the effect of his values and expectations and other unspecified variables on his responses in a testing situation. In many psychometric or psychophysical reporting methods, the two roles of the observer are often confounded in performance. Signal Detection Theory provides a descriptive and normative standard with which human performance in various situations can be compared. "Signal Detection is designed for the detection of weak signals against a background of noise . . . no theory of this kind is needed for the detection of strong signals that are never confused with the background noise" (Coombs et al., 1970, p. 166-167). The theory assumes that background noise is always present in amounts which vary randomly over time. In this study, the correct language form is the signal. Language assessment may be, in many cases, an ambiguous situation at best.

d'--Is an index number derived from application of Signal Detection Theory to a psychometric or psychophysical device. It is a measure of the subject's ability to discriminate his sensitivity to the task. It is a relatively pure measure of sensitivity which remains unaltered when such variables as attitude, motivation, and expectation are manipulated. Sensitivity and discriminability refer to what

psychologists label as ability. A low d' means low sensitivity for the task (Clark, 1974).

Lx--Is an index number derived from application of Signal Detection Theory to a psychometric or psychophysical device. It is a measure of the subject's response criterion or response strategy. Response criterion refers to all other behaviors other than ability. It is the likelihood-ratio criterion. Lx should be independent of changes in values of stimulus intensity or observer sensitivity. A high Lx means the subject has a high criterion for reporting reaction or responses to the stimulus. A lower Lx would indicate uncertainty as to whether a signal occurred or not. This, in turn, could indicate that internal/external noise was masking the ability to detect or discriminate (Clark, 1974).

Hit--In Signal Detection Theory as applied to psychometrics, a hit occurs when the subject answers "yes" to a signal-plus-noise interval or item.

False Alarm--In Signal Detection Theory as applied to psychometrics, a false alarm occurs when the subject answers "yes" to a noise only interval or item.

Limitations of This Study

This study is designed to compare the scores of the Cookson Hills Head Start children on three versions of the Grammatic Closure subtest of the ITPA. Thus, the results of this study may only be generalized to other Cookson Hills Head Start children.

CHAPTER II

A REVIEW OF RELATED LITERATURE

Introduction

The purpose of this chapter is to present information from the recent literature on the various aspects of language behavior. Further, the purpose is to look at studies on language behavior as it is related to performance on the Grammatic Closure subtest of the Illinois Test of Psycholinguistic Abilities. Moreover, literature covering remediation and intervention based on the ITPA will be discussed. To this end the chapter is divided into four sections: A discussion of the facets of language commonly assessed by language measures, Comprehension and Performance; Remediation and intervention in language disorders; Relevant ITPA research; and Liabilities in language assessment and assessment in general.

Comprehension and Performance

Comprehension and performance are the two terms which are at the heart of all discussions about language behavior and about methods of language assessment. The terms are applied to language by Chomsky, who, in discussing the operations present in language, pointed out that comprehension " . . . is the knowledge of syntax, meaning, and sound that makes performance possible" (McNeill, 1970, p. 145).

The general agreement is that comprehension precedes performance and may be intact even when performance is not possible (Fraser et al., 1963; Ervin, 1964; Brown, 1973, Schiefelbush and Lloyd, 1974; Kelley, 1967; Chomsky, 1971). In spite of all the theoretical agreement, many current studies and assessment techniques tend to assume that comprehension is intact if performance is intact and if the performance is defective, the assumption is tacitly made that comprehension is likewise defective. It seems, given the premise that in many expressive situations, comprehension usually precedes the ability to perform, it is not unlikely that this holds true for language abilities. Recognition precedes production in such areas as music recognition and visual recognition prior to motoric performance (McNeill, 1970). In fact, it seems likely that the ability to acquire and comprehend may not be deeply related to performance (Ervin, 1964; Bellugi and Brown, 1964; Goodglass and Hunt, 1961). A good example of this is a person with expressive aphasia, who, although able to comprehend and recall the correct forms is unable to produce them (Johnson and Myklebust, 1967). There are very few instances in language where the ability to perform in a grammatically correct manner would not be preceded by a comprehension of the correct inflectional form and the correct usage of it. Even in imitation (McNeill, 1970) if comprehension of a particular form is not present the child will tend to repeat the phrase changing it to suit his level of language behavior. For example, one might say to a child, "Do you have shoes on your feet?" And the child who may not have started to use irregular plurals might answer, "Yes, I have shoes on my foots."

Brown and Fraser (1964) say that it is through observing the child's errors in performance that one can find the best evidence for the child's comprehension of construction rules. They cite the example of a small boy saying, "I digged in the yard," which they say is obviously not an imitation of an adult model so it must have been generated from the child's comprehension of grammatical forms.

In assessing language production and comprehension, many times overt performance is the only criterion and the level of comprehension is merely assumed or estimated based on the overt performance. In the case of a high level of performance this assumption may come closer to being valid, however, in the case of a poor performance the degree of comprehension may be wrongly assumed to be likewise poor (Bartel, et al., 1973). Although the literature and common sense bear out the idea that comprehension and performance can be and are in many cases interdependent on one another, one still must look at the plethora of situations in which a child is found to have intact comprehension while performing at a substandard level (Bartel, et al., 1973; Miller and Ervin, 1964; Schiefelbush and Lloyd, 1974). While it is admissible that there are numerous instances in which the child's poor performance may be underpinned by lack of comprehension, it is as surely admissible that such factors as memory problems, attentional disorders, and phonation problems may be the underlying factors in a poor performance (Bartel, et al., 1973). In addition, such factors as reticence, physical test setting, and important others present may be the crucial ingredients which make for a poor performance (W. Jones, 1975; Moore, 1971; Swets, 1961; Newcomer, 1975; Cazden, 1975; Cazden, 1973).

In reducing language mechanisms to the two general levels of comprehension and performance, it seems that an analysis of the more numerous details involved in the acquisition and use of language is ignored. To attempt such an ambitious analyses as the latter would be a voluminous task. This study does not purport to do more than deal with the performance of children on the Grammatic Closure Subtest of the ITPA.

Remediation and Intervention

If the existing language tests are to be of any worth save identification of children's overt performance deficits and abilities, that value will lie in the efficiency with which they aid us in designing efficacious programs. Precisely what language programs should consist of is still a matter of debate and consequence.

It is difficult to say, after perusing the literature, just what are the most important aspects involved in dealing with efficient language acquisition and usage. As was mentioned earlier, early training and later remediation must be an individually-based situation. What is right for one child may be totally anomalous to another. The literature tends to advocate and illustrate programs which are general in nature, to be used with a group. These programs may be made applicable to individuals in many cases simply by fitting the programs to the level of need of the individual child.

Most of the studies have tended to deal with small samples and/or with children who possess non-standard English dialects. Many professionals in the field tend to dismiss language differences and disabilities as simple "speech" problems to be handled an hour a week by a

speech therapist, usually in a group. Language training programs are seen by many as applicable only to children from either bilingual homes or non-standard dialect homes. A view which is not shared by many professionals is the idea that a child's failure to use appropriate grammatical forms at an age when such usage should be appropriate is a serious problem and one which will possibly create even more serious learning problems. With this degree of ambivalence over what is meant by language training, it is not surprising that comprehensive studies are few and far between.

What has happened it seems is that the disagreements expressed on the theoretical level by linguists concerning what facets of language are most important in terms of assessment have translated themselves to the pragmatic level of remediation. Remedial ideas tend to align with test rationales rather than going beyond the rationales and looking at the child who is the recipient of the remedial measures.

The amount of time consumed in dispute over whether comprehension or production of language should be the basis of language programs (Brown, 1973) and based on this dispute the further discord over the specifics to be taught, is only time lost (Minskoff, 1975; Newcomer, Larsen, and Hammill, 1975). It is important that there are researchers who are willing to quantify and qualify the components of the dispute. It is equally important that practitioners use this research in an analytical manner and assess and remediate according to the child's unique needs. This places the burden on the practitioner to be cognizant of research, to choose carefully the instrument of assessment, and to be swift and precise in designing and carrying out the best remediation.

It is not the task of this paper to discuss in detail various modes of training language, for the very good reasons discussed above. Remediation is an individual process. If one will analyze the literature of the modern linguists, one will find that many of the most definitive studies have included as few as one to three subjects studied in a longitudinal manner (Menyuk, 1969; Miller and Ervin, 1964; Brown and Fraser, 1964). In this way normal language development was studied in an intimate and detailed manner. Those studies have had long-reaching effects on our understanding of language processes. It is felt that this is the way that remediation must proceed, in small groups, even one-to-one, over a period of time. This, too, can have long-reaching effects for the children involved.

Modeling of appropriate forms, particularly for disadvantaged children; teaching standard English usage; encouraging production of correct forms through imitation, spontaneous utterances, parent-child verbal interactions; and listening exercises are among the methods that have received a great deal of attention in the literature. All have virtues and usefulness to the clinician when applied correctly (Moore, 1971; Brown, 1973; Shuy, 1973; Fygetakis and Ingram, 1973).

Cazden (1975) offers a general language goal for any language program: " . . . the ability to communicate meanings in a verbal form of appropriate explicitness, for a particular audience, without undue reliance on a shared physical or interpersonal context" (p. 28). She further suggests:

> Language use in the total school environment, not just in a particular period of the day, should be the object of concern. And in addition to the situations that can be created in a school, dramatizations and games can simulate

> additional contexts and provide more concentrated encounters. Such simulation can be particularly important . . . to help some children overcome previous habits of coping with their world in nonverbal ways . . . (p. 29).

To reiterate, program writers and practitioners have an obligation to be knowledgeable about the various types of remedial measures that have been tried and the situations in which these measures have been successful. However, the real obligation is for these language professionals to handle this information with care and temper it with creativity when applying it to the individual child. True remediation is newly conceived and born with each individual assessment of a child's language behavior. While the method or materials used may not be a true neocreation, its molecular structure will be shifted to suit each new situation.

Relevant ITPA Research

One instrument which has seemed to have applicability in many situations is the ITPA and is one which has been widely used. A great many programs take their remedial direction from materials which are based on the various subtests of the ITPA. Much research has been done with the ITPA in the decade or so since it made its first appearance in its experimental version. It seems that no study has undertaken to examine the Grammatic Closure subtest alone, even though a recent book has called it the one true psycholinguistic measure on the ITPA (Hammill and Bartel, 1975). However, many of the studies did produce some significant facts concerning the Grammatic Closure subtest. For the purposes of this study only the Grammatic Closure subtest is of importance. Thus, the following subsection will cover information

relevant to the Grammatic Closure subtest and then will explore some of the research which points to the fact that training programs based on the ITPA may not be remediating as they are purported to be doing.

A perusal of the psychometric characteristics of the ITPA indicates that the intercorrelations among the subtests are relatively high. Grammatic Closure and two other subtests have communality with all other subtests except the memory tests. Paraskevopoulos and Kirk (1969) offer the notion that while it would be ideal if the intercorrelations on this test were zero, that in the real and complex world of the ITPA this is not to be expected. Their stance is generally defensive as might be expected from the test's creators. They do point out, however, that Grammatic Closure might reflect ability at the representational level rather than the automatic level. This would acknowledge the expressive/performance nature of this subtest (see Appendix A for Intercorrelations).

Probably the most significant findings concerning the Grammatic Closure subtest have to do with its link to reading and writing behaviors. At least two studies found that there is a possibility that performance on this particular subtest may give information concerning the child's later behavior in the expressive areas of reading and writing (Kirby et al., 1972; Newcomer et al., 1975). Further it was found by the creators of the ITPA that dyslexics tend to make lowered scores on the Grammatic Closure subtest (Paraskevopoulos and Kirk, 1969). In this same vein, three articles looked at scores on the ITPA and school achievement (Hammill et al., 1975; Newcomer and Hammill, 1975; Newcomer, 1975). The conclusion is that with intelligence held

constant, Grammatic Closure tends to be correlated with reading and spelling achievement.

The Grammatic Closure subtest is measuring some aspect of language behavior. And as Moore (1971) has pointed out, children with language deficiencies will not perform as well in school, especially on the language-oriented tasks of reading, spelling and writing. Adequate language behavior is usually cited as one of the indices of general intelligence. One study found that the Grammatic Closure subtest of the ITPA was the one subtest which correlated highest with the Stanford-Binet and WISC IQ's (Huizinga, 1973). This is interesting in light of a recent unpublished study which found that preschool children with considerable language deficiencies tend to miss those items on the WPPSI which are worded grammatically at a level above their current language functioning. The authors of this study theorized that the low IQ scores were not an indices of inferior intellectual functioning but were rather a function of the child's language behavior (Jones and Winston, 1975).

Only in the past five to seven years has the ITPA become the benchmark in assessing and remediating the learning disabled, language disordered child. At this point, the excessive numbers of children exhibiting reading and other learning problems in spite of special class placement and special remediation are testimony to the fact that current programs are failing to provide the experiences which are central to building effective learning behaviors.

A number of studies have found that the remediation based on the ITPA may be valueless since factor analyses have indicated that the test does not measure discrete psycholinguistic entities (Burns and

Watson, 1973; Newcomer, 1975; Bannatyne, 1973). A collection of 38 studies that have been done on outcomes of remediation based on the ITPA have been analyzed by the team of Hammill and Larsen (1974). Their findings indicate that much of the psycholinguistic training which is based on the ITPA has failed to effectively train psycholinguistic skills. The one subtest that did lend itself well to intervention and training was Verbal Expression. The programs studied and subsequently included in the Hammill and Larsen collection used a variety of methods. The methods were used with individuals, with groups, and with both in combination. One of the subtests most resistant to training was the Grammatic Closure subtest. Hammill and Larsen suggest that far too many of the programs aim at training expressive skills while ignoring receptive and automatic level skills.

Since it seems that training may be misdirected many times, then it is important to investigate tests and parts of tests which form the superstructure of so many training programs. The authors of the ITPA assign to the Grammatic Closure subtest a fairly vague definition of what it is measuring. The child's verbal response is the only criteria upon which to base notions of possible remediation. However, because of lack of definitive explanation, the assumption is made by some program creators that if the child's production is faulty, then his comprehension is likewise faulty and remediation based upon this assumption may aim at remediating skills which need no remediation while ignoring those that do need it (Kirk and Kirk, 1971). It may very well be that the Grammatic Closure subtest and other subtests of the ITPA are adequate for measuring psycholinguistic skills. Possible

misdirection of remedial measures based on the subtests will continue until more information is revealed by research.

When dealing with children who have language disorders, time is of the essence. Every minute of time spent training existent skills rather than deficient ones is bringing that child closer to the point when even correct training may be ineffective. There is an optimal time period in which language skills are gained and improved (C. Chomsky, 1969). It is not only that the non-remediated child may have communication problems and immature speech mannerisms, but also that he may face insurmountable reading, writing, and spelling problems (Moore, 1971; Newcomer, 1975).

Liabilities in Language Assessment and Assessment in General

Some writers feel that short-term tests (such as the Grammatic Closure subtest) and assessment in general may include extraneous factors which tend to complicate and cloud the picture which is gained of the child through testing (Moore, 1971; Cazden, 1972). Further, the language behavior of a child tends to be inconsistent in natural usage and would seem to be even more so in the artificiality of a test session. Thus, any one measure of a child's language would seem to be inadequate for building a program for the child (Lee, 1974; Moore, 1971; Cleary et al., 1975).

To accept the scores on short-term tests, one must accept two assumptions, that the sampling is adequate in amount and that the sampling is representative of area (Newland, 1975). Thus, it is important

that the examiner be cognizant of the reliability and validity information available on any test undertaken.

Further, if the short test is a subtest of a larger test, as is the case with the Grammatic Closure, it may be that the intercorrelations between the various subtests are so high that it is hard to know exactly what construct is being measured (Newland, 1975). This is true on the ITPA to some extend (Paraskevopoulos and Kirk, 1969).

The types of extraneous variables which impinge upon testing situations are myriad in nature and many in number, both unique to each new testing situation. Noise in the testing room, the child's reticence, examiner warmth, the child's health, race, or socioeconomic class, time of day, skill of the examiner, are among some of the variables which may play some part in the child's performance on any instrument (Newland, 1975; Cazden, 1972; Torrance, 1973; Newcomer, 1975).

Cazden (1972) discusses the social setting of the child in which his language is generated and collected. His actual speech behavior will be greatly affected by the socioeconomic factors. This would also affect his test behaviors.

In other words, a child shifts his language and speech behavior to fit specific situations including formal and artificial situation such as testing situations (Cazden, 1973). Testing situations are "interactionally impoverished" (Cazden, 1973, p. 143).

The ability to produce on demand, according to Shapiro (1973) is not equally valued in all educational programs and in all strata of our society and thus, the testing situation does not provide differential levels of responding according to the background of the child.

Cazden (1975) contends that it is the familiarity of the child with the situation and with the adult who is testing that will be the deciding factor. Language learned in a natural setting with familiar faces is not easily transferable to an artificial testing situation.

Studies of extraneous factors in general assessment, not specifically language, indicate that such issues as minor changes in test administration procedure, discouragement, examiner's level of experience, anxiety, and interpersonal warmth of the examiner tend to have significant effects on the ultimate score of the child in the testing situation (Sattler, 1967; Masling, 1959; Egeland, 1967).

Since most language instruments are intended as diagnostic examinations, it is important that the information that they yield be as free from bias and confounding material as is possible. Cleary et al. (1975) point out how very difficult this may be since most diagnostic instruments are based on very narrow, highly specified skills usually arbitrarily based on one or another single school of thought since there is usually little agreement among authorities in the area. Further, she feels that to properly design a good diagnostic test one must include a sufficient number of observations or test items to permit reliable measurement. This in itself would make the test bulky and too long, thus, few diagnostic instruments meet the criteria of adequate reliability. Cleary, too, points out the fact that tests with subtests (such as the ITPA) demonstrate such high intercorrelations that significant differential diagnosis occurs only for extreme cases.

Thus, it seems that not only are language disorders difficult to remediate and intervene with appropriately, they are even more

difficult to assess with any degree of confidence, accuracy, and specificity.

CHAPTER III

RESEARCH METHOD AND DESIGN

Selection of Subjects

Subjects (N=132) for this study were selected at random from the Cookson Hills Head Start units located in the Eastern Oklahoma area. They were selected from the 1975-1976 program. Their ages range from 3 years, 9 months to 5 years, 5 months. This group was chosen because most language researchers agree that a child's initial foundations of language development are at a fairly complete stage between the ages of four and five (Brown, 1973; Cazden, 1972; McNeill, 1970). Further, children at this age are still largely associated with the more natural environment of home and nursery school rather than the heavily language-oriented environment of kindergarten and first grade. The population and the sample contained white and native American children. Race was not controlled since only raw scores were used to analyze the data, thus, the ITPA norms which exclude native Americans from the normative sample are not an issue here.

Research Design

This study is designed to compare scores on the standard Grammatic Closure subtest of the Illinois Test of Psycholinguistic Abilities with scores on the Signal Detection modified version of the subtest, a

Restatement version of the subtest, and the index scores of d' and Lx. The Standard version was given first and then the variations were given immediately following the first administration. Each item on the Signal Detection version was followed immediately by an elicitation of a Restatement. For example, the Signal Detection version might be worded thus, "Here is a foot, are these foots?" The restatement would involve immediately asking "What are they?" This restatement was not only a double-check on the child's comprehension of the stimulus in the Signal Detection task, it was also a form of test-retest with interference. Gleason (1967) points out that such an elicitation allows the child to respond at the level of language at which they are currently operating.

The index numbers of d' and Lx were derived from the Signal Detection modified version of the Grammatic Closure subtest. They represent the subject's sensitivity to the task (d') and his strategy as a decision maker (Lx).

The raw scores on the standard version and the two variations and the two index scores were intercorrelated using Pearson's Product-Moment Correlation Coefficient. The .05 level of confidence was chosen as the level at which the coefficients may be said to be significantly different from zero.

The Signal Detection version of the Grammatic Closure subtest, when compared with the Standard version, provided a comparison between comprehension and performance of language respectively. In the Standard version the child was asked to respond orally (performance) while in the Signal Detection version the child only responded with a yes or no to the stimuli to indicate comprehension.

Research Questions

This study was designed to answer the following questions:

1. Does the child's score on the Grammatic Closure subtest represent his true sensitivity to the task of discriminating the correct grammatical form or is it heavily influenced by "other" factors or noise?

The correlation between the total raw score on the Standard version of the Grammatic Closure subtest and d' and the correlation between the scores on the Standard version and Lx provided an answer to this question.

2. Does the score on the Grammatic Closure subtest represent both comprehension and performance of language?

The correlation between the Standard version and the Signal Detection version provided an answer for this question.

The Test Instrument

The Grammatic Closure subtest of the ITPA gives information about the child's ability to use standard English inflectional forms. The score is reported in terms of a raw score, a scaled score, and a psycholinguistic age score. The total raw score is the score to be treated statistically in this study.

The Signal Detection version of the Grammatic Closure subtest measures the child's ability to comprehend and detect the correct form when it is presented to him orally and pictorally. The test is modified to give a measure of sensitivity and response strategy (Jones, 1975). Gleason (1967) uses a similar variation with a similar

instrument to show, in essence, that the child comprehends the forms but may not be able to produce them correctly. Jones (1975) has theorized that a certain proportion of children's scores on certain instruments is reflective of interfering stimuli (noise, reticence, state of health, rapport with the examiner). He uses a matrix for recording children's answers so as to give a count of how many "hits" (giving the yes response when the correct stimulus is presented) the child has in comparison to "false alarms" (giving the yes response when an incorrect stimulus or noise only is presented). The matrix also includes cells for incorrect rejections and correct rejections which were recorded in this study but only the correct rejections were used and that was in obtaining the total raw score on the Signal Detection version, hits plus correct rejections. The items of the ITPA Grammatic Closure subtest which were used for false alarm items were chosen at random. This version of the subtest yields a raw score and two index scores, d' and Lx. When a test does not contain naturally occuring yes-no answers, it may either be extended or modified to gain Signal Detection items (Jones, 1975).

A further variation of the subtest is the Restatement portion which follows, item by item, the Signal Detection version. It involves asking the child to repeat the stimulus used in the SD version. This gives the child the option of performing at the level of language which best represents his ability and also is a method by which the child is helped to understand the SD task (Gleason, 1967).

Intercorrelations for the Illinois Test of Psycholinguistic Abilities are presented in Appendix A. Questions for both variations of the subtest are presented in Appendix B.

Procedure

Collection of the data was accomplished through individual sessions with each of the 132 children in this study. Each child was seen for one 10 to 20 minute session in an empty room at each Head Start location. The testing session was devoted to administering the Standard and modified and the Restatement versions of the Grammatic Closure subtest. In the Standard form, the child was presented with various pairs of pictures and was asked to complete the verbally presented, unfinished sentence, such as "Here is a dog; here are two ____." In the Signal Detection version, the child was shown the pairs of pictures and the examiner said, "Here is a dog; here are two dogs. Are these dogs?" and the child answered yes or no either verbally or motorically by nodding his head. In order to check comprehension and the ability to detect the correct stimuli, half of the items on the Grammatic Closure Signal Detection version presented an incorrect stimulus. An example of this is "The thief is stealing the jewels. These are the jewels that he stealed. Are these the jewels he stealed?" As a further check on comprehension and as a method to help the child to be aware of what part of the stimulus he was to attend to, the examiner followed his first question with an open-ended question. For example, in the illustration above: "Here is a dog; here are two dogs. Are these dogs?" (Child's reply), "What are they?" (Child's reply); or "The thief is stealing the jewels. These are the jewels that he stealed. Are these the jewels that he stealed?" (Child's reply), "What did the thief do?" (Child's reply). The underlined final questions are the Restatements. The restatement is also another check on comprehension and performance.

This is in keeping with Gleason's (1967) variation on her test which is similar to the Grammatic Closure subtest. All items on all versions of the subtest were given to the children.

Summary

In this chapter the design of the study was described. This included a description of the subjects and the test used. The Grammatic Closure subtest of the ITPA and a Signal Detection modified version of the same subtest and a Restatement version were administered to 132 Head Start children in the Cookson Hills Head Start unit of Eastern Oklahoma. The scores on the three versions of the subtest plus the two index scores, d' and Lx, derived from the Signal Detection version were compared using Pearson's Product-Moment Coefficient with a .05 level of probability set as the acceptable level of significance.

CHAPTER IV

RESULTS

The purpose of this chapter is to present the results of the study in terms of an analysis of the data. This study sought to answer two research questions. These questions were addressed to discovering how much of the child's performance on the Grammatic Closure subtest is due to true discriminability and how much may be due to the child's response strategy. In other words, how much may be due to ability and how much to noise in the situation or the child. The second question is concerned with the Grammatic Closure subtest's ability to differentiate between comprehension and performance of the correct grammatical form.

The scores were gathered on the Standard Grammatic Closure subtest and the Signal Detection version of the subtest and the Restatement version of the subtest. Further a d' (sensitivity) and an Lx (response strategy) were derived from the Signal Detection version.

Thus, several index numbers and raw score were produced for analysis. These included d', Lx, total raw scores on the Standard Grammatic Closure subtest, total raw scores (hits plus correct rejections) on the Signal Detection version of the subtest, and total raw scores on the Restatement version of the subtest. Raw scores were used in order to utilize the child's total language output.

Ten Pearson Product-Moment Correlation Coefficients were obtained (see Table I).

TABLE I

CORRELATION MATRIX

	A	B	C	D	E
A	____	.20*	-.10	.09	.67**
B		____	-.72**	.29**	.05
C			____	-.50**	-.09
D				____	.24**
E					____

*p = .05
**p = .01

Note: A = Total raw score on Standard Grammatic Closure subtest
B = d'
C = Lx
D = Total raw score on Signal Detection version
E = Total raw score on the Restatement version

The correlation between the total raw score on the Standard version and d' was .20 which was significant at the .05 level of confidence. This r speaks to the relationship between the child's ability to discriminate the correct form and their performance on the Standard version.

The correlation between the total raw score on the Standard version and Lx, the index number of noise (or motivation or responding strategy), was -.10 which was not significant.

Also found to be non-significant was the correlation between the total raw score on the standard version and the total raw score on the Signal Detection version. This correlation represents a comparison of performance with comprehension.

The correlation between the Standard version and the Restatement version was .67 which was significant at the .01 level. This correlation represents a test-retest with interference.

The correlation between d' and Lx was -.72 which was significant at the .01 level and represents a negative relationship between ability and strategy which is a violation of Signal Detection Theory.

The correlation between d' and the total raw score on the Signal Detection version was .29 which was significant at the .01 level. This correlation represents the relationship between comprehension and sensitivity for the task.

The correlation between d' and the Restatement version was .05 which was not significant. This correlation represents the relationship between sensitivity and a test of performance and comprehension.

The correlation between Lx and the Signal Detection version was -.50 which was significant at the .01 level. This correlation represents a negative relationship between response strategy and comprehension.

The correlation between Lx and the Restatement version was -.09 which was not significant. This correlation represented the

relationship between response strategy and performance and comprehension of the correct form.

The correlation between the total raw score on the Signal Detection version and the Restatement version was .24 which was significant at the .01 level. This correlation represents the relationship between comprehension and performance combined and comprehension alone (see Table II for S. D. and Means of each score or index number).

TABLE II

STANDARD DEVIATIONS AND MEANS OF COEFFICIENTS

	Mean	S. D.
A	9.61	3.73
B	-.03	.60
C	1.83	2.05
D	16.73	2.01
E	13.12	5.04

In order to determine if the ability displayed on the Standard version (rAB) which is representative of performance of language was superior to the ability displayed on the Signal Detection version (rBD) which is representative of comprehension of language, a t test to

compare correlated coefficients of correlation was performed between the correlation coefficients of AB and BD (Guilford and Fruchter, 1973). The t obtained was .54 which was not significant.*

*A further analysis of the data was performed to look at the variance between high and low scorers on the Standard version in terms of their Lx and d' scores. The results showed no significance. Other than mentioning lack of variance, presumably because of the compliance set in answering on the Signal Detection version (from which d' and Lx are derived), this analysis will not be included in this study.

CHAPTER V

SUMMARY, CONCLUSIONS, AND DISCUSSION

Summary

The primary purpose of this study was to determine the validity of the Grammatic Closure subtest of the Illinois Test of Psycholinguistic Abilities as a measure of language ability. The tests used were the Standard version of the Grammatic Closure subtest, a Signal Detection version of the subtest, and a Restatement version of the same subtest.

One hundred and thirty-two Eastern Oklahoma Head Start children were tested individually with each of the three versions of the subtest. The data obtained were analyzed using Pearson's Product-Moment Coefficient of Correlation.

Conclusions and Discussion

In order to give cogent answers to the two research questions involved in this study, the relevant correlation coefficients must be discussed first. One remark and observation which must be made here is that all the correlation coefficients may be called into question by the fact that this population sample had a tendency on the Signal Detection version to say "yes" to almost every stimulus question. There

was an overwhelming bias in the form of acquiescence or compliance. This was not true of the children's behavior on the Restatement version.

The case for compliance on the Signal Detection version may be made from a perusal of the mean obtained by the children on this version. The mean score for the Signal Detection version was 16.73 which is approximately the score which would be gained by replying "yes" to every item. This compliance may be seen further in the mean score on d' which was -.03 indicating that the distributions of noise and noise plus signal heavily overlapped indicating almost no variation in response (McNicol, 1972).

In answer to the first research question: "Does the child's score on the Grammatic Closure subtest represent his true sensitivity to the task of discriminating the correct grammatical form or is it heavily influenced by "other" factors or noise?" there is a small degree of support for the construct validity of the test in measuring language production. This is seen in the small but significant correlation between d' and the Standard version of the subtest. The tendency of the children to comply on the Signal Detection version from which d' is derived tends to obscure the real meaning of d' though. The correlation between the Standard version and Lx is not significant which indicates that response strategy or noise (in this study compliance) had a minimal effect on the scores obtained on the Standard version. This was further supported by the fact that Lx did not correlate with the Restatement version either. The Standard version and the Restatement version correlate highly (.67) with one another.

Thus, even with noncompliance, the children obtained approximately average scores on the Standard version and above average scores on the Restatement version (Paraskevopoulos and Kirk, 1969). This may be seen in the mean scores reported for the group on each version of the test. So scores obtained on the Standard and Restatement versions were not reliant on response strategy.

The relationship obtained between d' and Lx was highly significant in a negative direction. The fact that there is any correlation between two supposedly independent indices (Jones, 1975) is a violation of Signal Detection Theory. An individual's ability to detect a signal, d', tends to remain constant and independent of changes in response strategy. Thus, sensitivity to (or ability to discriminate the correct form) should not vary with changes in the method of responding, Lx. However, it did vary. The manner in which Lx (or compliance here) operated in obtaining scores on the Signal Detection version may account for this. As Lx went down which indicates more noise (in this case the response set to comply) d' went up. d' and the Signal Detection version were significantly correlated while the Signal Detection version and Lx are negatively correlated, thus, scores on the Signal Detection version went up as Lx went down. There is evidence in the literature that a response bias to say "yes" tends to raise scores on d' (Parasuraman, 1975).

Thus, it seems that the only way that children obtained scores on the Signal Detection version was through compliance/acquiescence. In other words, a lax response criterion or strategy tended to be a good one for raising scores. Those few who did not comply tended to have lower scores and higher Lx's. To say "no" was showing a high response

criterion which indicates the child was being very cautious. This caution deflated the score on this version. The strategy behavior was not clearly separated from sensitivity (witness the correlation between d' and Lx) since strategy (response set to say "yes") made the scores go up on d' and the Signal Detection version. Thus, it seems that the children know very little in this language area which accounts for low significant r's on the correlations between d' and the Standard version, between d' and the Signal Detection version, and between the Signal Detection version and the Restatement. This latter correlation probably is representative of the fact that the Restatement employs some comprehension of forms which would correlate with the Signal Detection version since it utilizes comprehension as its main responding style. However, to get back to the discussion of the low but significant correlations between d' and the Standard and Signal Detection versions and between the Signal Detection and Restatement versions, it is important to recognize that they are significant in spite of the size of the correlation coefficients. And although d' was not high as an index number (mean = -.03) for the group, if one can be optimistic while still holding the confounding effects of compliance in mind, then it can be said that there is modest support for the construct validity of the Grammatic Closure subtest as a measure of language production.

In the literature on the response of compliance/acquiescence in testing situations, acquiescence is seen to be a stable responding style by some authors (Bentler et al., 1971). Others (Rorer, 1965) attribute acquiescence to the content of the situation. It is difficult to determine which explanation of compliance applies in this instance. Do Head Start children acquiesce more than others in the population of

children? If one can link compliance/acquiescence to the idea of an external locus of control, then there is support in the literature (Rotter, 1972) for a stable responding style. Rotter points out that people from lower socioeconomic levels tend to be more externally controlled (compliant to authority figures) as do young children. The Head Start is composed, by admission criteria, of young children from the lower socioeconomic societal group. However, the fact that the children failed to comply on the Restatement version tends to argue for the content explanation of acquiescence. On the Restatement version, the children could have complied. When asked to restate on each item, the children could have acquiesced and repeated the examiner's incorrect stimulus. The majority did not do this. As mentioned earlier, some children responded correctly to some items that they did not respond to correctly on the Standard version. In fact, many of the children corrected an incorrect stimulus presented on the Signal Detection version when asked to restate the stimulus on the Restatement version. For clarification, a child might have gotten the item: "Here is a foot; here are two ____." wrong on the Standard version. Then on the Signal Detection version, that item was a potential false alarm item and since many children complied, the responses went as follows: "Here is a foot. Here are two foots. Are these foots?" The children overwhelmingly replied yes to this item. However, when asked to restate, "what are they?" many replied "feet." This speaks to the irregularities of children's language behavior at this young age (Lee, 1974). It also speaks to compliance/acquiescence in certain situations based on content. A child is more likely to agree with an adult

stranger even when he says something incorrect like "foots" than he is willing to say such an incorrect word himself when asked to repeat it.

Interestingly enough, the Restatement version did not correlate significantly with d' which may indicate that scores obtained on this version are unrelated not only to response strategy but also to the child's ability to discriminate. However, the children obtained above average scores on the Restatement version so it is measuring some aspect of language. Further study of the Restatement method of assessing language may present evidence indicating that it is a useful manner of assessment. The children tended to give correct answers on this version when they had not on the Standard.

In looking at the data designed to answer the second question: "Does the score on the Grammatic Closure subtest represent both comprehension and performance of language?" it was found that there was no significant correlation between the scores on the Standard version of the subtest and the scores on the Signal Detection version of the subtest. Since the Standard version elicits performance of language and the Signal Detection version relies on comprehension of the correct form, this would seem to speak to the idea that the score on the Standard version does not reflect comprehension. This would be true for the low scorers on the standard version. For the high scorers, one may assume comprehension.

d' correlated significantly with both the Standard version and the Signal Detection version. In view of the lack of a significant correlation between the two versions and the implication that comprehension of language and performance of language may not be related in this study, it was important to see if the d' correlation with the Standard

version was superior to the d' correlation with the Signal Detection version. The results of a correlated coefficients' t test revealed that there was no significant difference between the two coefficients. Thus, it seems that the score obtained on the Standard version does not clearly represent both performance and production of inflectional forms.

The Grammatic Closure subtest does seem to be a modestly effective manner of assessing children's language production. It still seems important that the scores yielded by this test not be taken to make assumptions concerning the child's comprehension of correct forms. Further, as mentioned earlier, the Restatement version may be a moderately effective manner of assessing children's language. The children failed to comply on this version and received a higher mean score than on the Standard version.

Suggestions for Further Studies

This study might be replicated with a group of middle-class preschoolers to see if socioeconomic level might have significance here. Further, a study of acquiescence and locus of control might be made across several situations to see if there is a stable responding style of acquiescence. The Grammatic Closure subtest should be compared by High and Low scoring groups on the subtest with other language measures which discretely measure the behaviors of comprehension and performance. Further, the Grammatic Closure subtest could be reworked so as to more nearly represent a normal developmental language sequence. Children at this young age are penalized by the ceiling on this test. It was found in this study, when all items were given, that many

children scored points far above that ceiling. If there is to be a ceiling on the test for this age group, then it should be made certain that items above that ceiling are generally developmentally outside the range of the general population of children at this age level.

The responses of Native American children on this test as compared with white children should be investigated. Indian youngsters tend to handle plurals in an entirely different manner than whites. Actually they are more efficient than Standard English grammar in that they feel that plural inflections are redundant if a modifier such as number (two, many, etc.) precedes the noun. Such a study could add to the growing body of knowledge concerning divergent dialects.

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APPENDIXES

APPENDIX A

INTERCORRELATIONS OF THE SUBTESTS OF THE ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES

TABLE III

MEDIAN (LOWER TRIANGLE) AND MEAN (UPPER TRIANGLE) CORRELATIONS BETWEEN ITPA SUBTESTS ACROSS THE EIGHT AGE LEVELS (PARASKEVOPOULOS AND KIRK, 1969, p. 186)

1. Auditory Reception		.38	.52	.38	.27	.25	.49	.25	.15	.21	.28	.22
2. Visual Reception	.36		.43	.38	.23	.24	.39	.30	.08	.26	.28	.23
3. Auditory Associa.	.48	.48		.44	.38	.35	.60	.32	.26	.25	.36	.31
4. Visual Association	.34	.38	.44		.29	.26	.41	.32	.10	.27	.23	.23
5. Verbal Expression	.28	.24	.40	.34		.37	.35	.28	.14	.09	.22	.18
6. Manual Expression	.26	.25	.35	.26	.40		.31	.21	.14	.16	.20	.10
7. Grammatic Closure	.50	.35	.54	.44	.34	.26		.30	.22	.23	.35	.32
8. Visual Closure	.28	.28	.36	.32	.27	.18	.31		.09	.26	.20	.16
9. Visual Seq. Mem.	.14	.06	.28	.10	.16	.14	.19	.08		.16	.13	.12
10. Auditory Seq. Mem.	.12	.27	.22	.28	.08	.10	.21	.24	.16		.18	.17
11. Auditory Closure	.26	.24	.40	.25	.20	.14	.38	.20	.13	.16		.31
12. Sound Blending	.24	.20	.30	.23	.19	.06	.27	.14	.16	.16	.30	

APPENDIX B

QUESTIONS FOR THE SIGNAL DETECTION MODIFIED AND THE RESTATEMENT VERSIONS OF THE GRAMMATIC CLOSURE SUBTEST

Stimulus Words are underlined.

Demonstration: Here is a bed. Here are two beds. Are these beds? What are they?

1. Here is a dog. Here are two dogs. Are these dogs? What are they? (hit)

2. This cat is under the chair. This cat is on the chair. Is this cat on the chair? Where is the cat? (indicating the cat on the chair) (hit)

3. Each child has a ball. This is hers and this is hims. Is this hims? Whose ball is this? (indicating the boy) (false alarm)

4. This dog likes to bark. Here he is barks. Is he barks here? What is he doing here? (false alarm)

5. Here is a dress. Here are two dressing. Are these dressing? What are these? (false alarm)

6. The boy is opening the gate. Now the gate has been opened. Has the gate been opened here? What did he do to the gate? (hit)

7. There is milk in this glass. It is a glass of milk. Is this a glass of milk? What is it? (hit)

8. This bicycle belongs to John. It is John bike. Is it John bike? Whose bike is it? (false alarm)

9. This boy is writing something. This is what he wrote. Is this what he wrote? What did the boy do? (hit)

10. This is the man's home and this is where he works. Here he is going to work and here he is going to home. Is he going to home here. Where is he going here? (indicating home) (false alarm)

11. Here it is night and here it is morning. He goes to work first thing in the morning and goes home first thing at night. Does he go home first thing at night? When does he go home? (hit)

12. This man is painting. He is a paints. Is he a paints? What is he? (false alarm)

13. The boy is going to eat all the cookies. Now all the cookies have been ate. Have all the cookies been ate? What was done by the boy to the cookies? (false alarm)

14. He wanted another cookie, but there weren't anymore. Were there anymore cookies? Why couldn't he have another cookie? (hit)

15. This horse is not big. This horse is big. And this horse is even bigger. Is this horse bigger? What is this horse? (hit)

16. And this horse is the very biggest. Is this horse the biggest? What is this horse? (hit)

17. Here is a man. Here are two mans. Are these mans? What are they? (false alarm)

18. The man is planting a tree. Here the tree has been plants. Has the tree been plants here? What did he do to the tree? (false alarm)

19. This is soap. And these are soap. Are these soap? What are they? (hit)

20. This child has lots of blocks. This child has even more. Does this child have more. What does she have? (hit)

21. And this child has the mostest. Does she have the mostest? What does she have? (false alarm)

22. Here is a foot. Here are two foots. Are these foots? What are they? (false alarm)

23. Here is a sheep. Here are lots of sheep. Are these sheep? What are they? (hit)

24. This cookie is not very good. This cookie is good. This cookie is even better. Is this cookie better? What is this cookie? (hit)

25. And this cookie is the very best. Is this cookie the very best? What is this cookie? (hit)

26. This man is hanging the picture. Here the picture has been hanged. Has the picture been hanged here? What did he do to the picture? (false alarm)

27. The thief is stealing the jewels. These are the jewels that he stealed. Are these jewels that he stealed? What did he do to the jewels? (false alarm)

28. Here is a woman. Here are two women. Are these women? What are they? (hit)

29. The boy had two bananas. He gave one away and kept one for him. Did he keep one for him? Who did he keep one for? (false alarm)

30. Here is a leaf. Here are two leaves. Are these leaves? What are they? (hit)

31. Here is a child. Here are three childs. Are these childs? What are they? (false alarm)

32. Here is a mouse. Here are two mice. Are these mice? What are they? (hit)

33. These children all fell down. He hurt himself, she hurt herself. They all hurt theirselves. Did they hurt theirselves? Who did they hurt? (false alarm)

VITA

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Doctor of Education

Thesis: A STUDY TO DETERMINE THE CONSTRUCT VALIDITY OF THE GRAMMATIC CLOSURE SUBTEST AS A MEASURE OF LANGUAGE ABILITY USING SIGNAL DETECTION THEORY

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